

R E M A R K S

Claims 1, 5-11 and 13-15 are now in this application, and are presented for the Examiner's consideration.

Prior Art Rejections

Claims 1-3 and 15 were rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,577,890 to Nielsen.

The limitations of claim 4 have been added to claim 1, and claim 4 has been canceled. Since claim 4 was not rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,577,890 to Nielsen, it is submitted that this rejection has been overcome.

According to amended claim 1, the extent of the phase shift between voltage and current is determined at different times. From the measured values, the chronological progression of the phase shift can be determined. One characteristic of this chronological progression of the phase shift is assigned to a predetermined pump operating state, in a following assignment step.

Nielsen discloses a pump control system in which the phase shift between an alternating voltage and an alternating current is determined at different times. According to this system, the absolute value of the phase shift is taken as an indicator for the pump state (see column 6, lines 19 to 32). It is

acknowledged that such a system and method is known from the state of the art.

However, Nielsen does not disclose or even remotely suggest determining the chronological progression, that is, the development of the phase shift over time from different recorded measured values. The present invention is based on the finding that one characteristic of the chronological progression, for example, the slope of a curve representing the chronological progression can be taken for as an indicator for a pump state. This teaching is clearly missing in Nielsen.

In this regard, claim 1 now recites that the determination step:

determines an extent of a phase shift between the alternating voltage and the alternating current at different times from the recorded measured values,

determines the chronological progression of the phase shift from the recorded measured values, and

determines a characteristic of the chronological progression.

As discussed above, this aspect is nowhere disclosed or suggested in Nielsen.

Accordingly, it is respectfully submitted that the rejection of claims 1-3 and 15 under 35 U.S.C. §102(b) has been overcome.

Claims 4-6 and 9-14 were rejected under 35 U.S.C. §103(a) as being obvious from Nielsen in view of U.S. Patent No. 5,362,206 to Westerman et al.

The remarks previously made in regard to Nielsen are incorporated herein, and therefore not repeated.

According to Westerman et al, the phase shift angle is summed over a large number of power cycles to create a motor load control function, resulting in an integral. When the integral exceeds a predetermined value, a certain pump state is recognized (see column 7, lines 20 to 28).

According to this method, different values for the phase shift are measured at different times. However, the resulting integral does not contain any information about the chronological progress of the phase shift. For example, a first development in which the phase shift is increasing in time leads to the same integral as a second development of the phase shift which decreases with time. The chronological information simply gets lost in the integral, making it impossible to examine any further characteristic of the progress of the phase shift.

Therefore, Westerman et al also fails to disclose or even remotely suggest the determination step which:

determines the chronological progression of the phase shift from the recorded measured values, and

determines a characteristic of the chronological progression.

It was stated that Westerman et al discloses determining a chronological progression of the phase shift from the multiple recorded values at column 7, lines 20-22. However, the summing of the resulting phase angle over a large number of power cycles to create a motor load control function, is not the same as determining a chronological progression. Rather, the sum produces a single value, rather than a chronological progression. As discussed above, the chronological progression is the development of the phase shift over time from different recorded measured values. This is represented, for example, by a curve, rather than a single summed value. Then, a characteristic of the chronological progression, for example, the slope of a curve representing the chronological progression can be taken for as an indicator for a pump state. This teaching is clearly missing in Westerman et al.

Therefore, even if Nielsen and Westerman et al are combined, it becomes clear from the above that the subject matter of the present claimed invention could not be derived from a combination of the cited references.

As to device claim 11, it is noted that the limitations of claim 12 have been added thereto, and claim 12 has been canceled. It is further noted that claim 11 depends from claim 1, and therefore includes all of the limitations thereof. It is submitted for this reason alone, device claim 11 is allowable for the same reasons as claim 1.

Claim 11 now recites that the memory comprises a number of memory cells to save a sequence of memory contents, which is especially suitable for carrying out the method as claimed by the amended claim 1.

Accordingly, it is respectfully submitted that the rejection of claims 4-6 and 9-14 under 35 U.S.C. §103(a) has been overcome.

Claims 7 and 8 were rejected under 35 U.S.C. §103(a) as being obvious from Nielsen and Westerman as applied above, and further in view of by U.S. Patent No. 4,896,101 to Cobb.

The remarks previously made in regard to Nielson and Westerman et al are incorporated herein, and therefore not repeated.

Cobb relates to an invention for monitoring and evaluating the performance of machines such as electro mechanically or pneumatically driven valves, and also evaluates motor driven pumps. However, there is no disclosure or even a remote suggestion in Cobb of determining any phase shift whatsoever, let alone a phase shift between an alternating voltage and an alternating current at different times from recorded measured values, then determining the chronological progression of the phase shift from the recorded measured values, and then determining a characteristic of the chronological progression

The fact that a Fourier transform is used is of no regard, since Fourier transforms that operate on signals are known.

However, it has not previously been known in the context of the present invention. Cobb fails to disclose determining a chronological progression of a phase shift as claimed, so that the use of a Fourier transform thereon is also not disclosed or suggested by Cobb.

In any event, since the above determination step is not disclosed or even remotely suggested in Cobb, it is clear that Cobb fails to cure any of the aforementioned deficiencies of Nielsen or Westerman et al, and therefore, when combined therewith, would still not produce the present claimed invention.

Accordingly, it is respectfully submitted that the rejection of claims 7 and 8 under 35 U.S.C. §103(a) has been overcome.

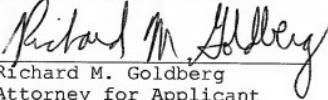
If the Examiner has any comments, questions, objections or recommendations, the Examiner is invited to telephone the undersigned at the telephone number given below for prompt action.

In the event that this Paper is late filed, and the necessary petition for extension of time is not filed concurrently herewith, please consider this as a Petition for the requisite extension of time, and to the extent not tendered by check attached hereto, authorization to charge the extension fee, or any other fee required in connection with this Paper, to Account No. 07-1524.

The Commissioner is authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 07-1524.

In view of the foregoing amendments and remarks, it is respectfully submitted that Claims 1, 5-11 and 13-15 are allowable, and early and favorable consideration thereof is solicited.

Respectfully submitted,


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